Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

46th Annual Scientific Meeting, November 3rd - 4th, 2023
Conference Proceedings
International Journal of Exercise Science, Issue 9, Volume 12

Reduced-Exertion High-Intensity Interval Training Improved Post-Prandial Blood Glucose in Healthy, Recreationally Active Middle-Aged Men

Bilal A. Chaudhry[1,2], Jesse Stabile Morrell[2], Summer B. Cook[2], and Michael S. Brian[2].
[1]Rutgers University, New Brunswick, NJ, [2]University of New Hampshire, Durham, NH

Men are at a greater risk of developing insulin resistance and poor blood glucose control at an earlier age compared to women. Although 30-minute exercise bouts can improve glucose control, "lack of time" is often cited as a primary barrier to exercise. Reduced-Exertion High-Intensity Interval Training (REHIT) exercise consists of 10-minutes of unloaded cycling interspersed with two 20-second sprints with resistance set to 5% body weight. Previous studies have reported that REHIT leads to improved oral glucose tolerance and 24-hour (24h) glucose responses under controlled feeding conditions in healthy young and middle-aged adults with metabolic dysfunction. However, the ecological relevance of REHIT under habitual conditions and a standardized mixed meal (55% carbohydrate, 25% fat, 20% protein) remains unknown in healthy, active, middle-aged men. **PURPOSE:** This study investigated the effects of a single bout of REHIT on 3h post-prandial and 24h blood glucose measures in physically active, middle-aged men compared to a non-exercise control condition (Non-EX). **METHODS:** Twenty physically active men (Age: 52±8 years; VO_2max: 44.5±6.0 $mL \cdot min^{-1} \cdot kg^{-1}$; BMI: 24.3±1.7 $kg \cdot m^{-2}$) completed a randomized crossover study comparing REHIT to Non-EX. All participants completed the 10-minute REHIT exercise bout and Non-EX condition 30 minutes after consuming a standardized breakfast, and then consumed their habitual diet for the rest of the day. Continuous glucose monitors measured 24h interstitial glucose every five minutes throughout the duration of the study. The continuous glucose monitor data were analyzed to measure post-prandial and 24h mean glucose control and glycemic variability (mean amplitude of glycemic excursions, MAGE; coefficient of variation, 24h CV). **RESULTS:** REHIT blunted 3h post-prandial blood glucose responses to breakfast (REHIT: 110.2 ± 5.6 vs. Non-Ex: 137.6 ± 5.6, $p<0.001$) but not 24h average blood glucose (REHIT: 118.9 ± 14.0 vs. Non-EX: 117.2 ± 13.1 mg/dL, $p=0.453$) or measures of blood glucose variability: 24h standard deviation of blood glucose (REHIT: 16.6 ± 5.2 vs. Non-EX: 18.1 ± 5.5 mg/dL, $p=0.173$), 24h MAGE (REHIT: 2.5 ± 0.9 vs. Non-EX: 2.6 ± 0.9 mmol/L, $p=474$), and 24h CV (REHIT: 14.6 ± 4.0 vs. Non-EX: 14.9 ± 4.6 %, $p=0.746$). **CONCLUSION:** Post-breakfast REHIT blunted post-prandial glucose responses in active middle-aged men. However, these effects did not carry over throughout a 24h period. REHIT may provide an ideal regimen to acutely blunt post-prandial glucose responses in healthy middle-aged men, but it does not reduce 24h mean glucose or glucose variability. **SIGNIFICANCE/NOVELTY:** This is the first study to assess the benefits of REHIT under a more ecologically relevant study design. These findings suggest limited glucose regulation benefits in healthy, active, middle-aged men following a single bout of REHIT under ecologically-relevant conditions.